Serial No. : 10/561,048
Filed : December 14, 2005

Page : 2 of 17

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of claims

1. (Currently amended) A method for the production of a fluorinated phenylenediamine represented by the following formula (2), which comprises a step[[s]] of reacting a diamide represented by the following formula (1) with NaOX [wherein X stands for a bromine atom (Br) or a chlorine atom (Cl)] at a molar ratio of the NaOX to the diamide (NaOX/diamide ratio) in the range of 3.0 - 6.0 and NaOH at a molar ratio of the NaOH to the diamide (NaOH/diamide ratio) in the range of 1.3 - 6.0,

$$F_1$$
 Y_m (2) $(NH_2)_2$

wherein in the formulas (1) and (2), Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent, 1 is an integer in the range of 1 - 4, m is an integer in the range of 0 - 3, provided that the total number of 1 and m (1 + m) is 4.

 (Original) A method according to claim 1, wherein said diamide is reacted with NaOX and NaOH at a temperature in the range of 0 - 20°C and the resultant reaction product is heated at a temperature exceeding 20°C and not exceeding 100°C.

Serial No. : 10/561,048
Filed : December 14, 2005

Page : 3 of 17

 (Previously presented) A method according to claim 1, wherein said diamide is a diamide represented by the following formula (4) and said phenylenediamine is a phenylenediamine represented by the following formula (5),

wherein in the formulas (4) and (5), Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent.

- (Previously presented) A method according to claim 1, wherein the molar absorption coefficient of the fluorinated phenylenediamine represented by the formula (2) at a wavelength of 450 nm is not more than 2.5 (I/mol·cm).
- 5. (Previously presented) A method for the production of a polyamic acid represented by the formula (9), which comprises the steps of:

producing a fluorinated phenylenediamine represented by the formula (2) by reacting a diamide represented by the formula (1) with NaOX [wherein X stands for a bromine atom (Br) or a chlorine atom (Cl)] at a molar ratio of the NaOX to the diamide (NaOX/diamide ratio) in the range of 3.0 - 6.0 and NaOH at a molar ratio of the NaOH to the diamide (NaOH/diamide ratio) in the range of 1.8 - 6.0; and

reacting the fluorinated phenylenediamine with tetracaraboxylic acid represented by the formula (8), the acid anhydride or acid chloride thereof, or the ester thereof in an organic solvent,

Serial No. : 10/561,048 Filed : December 14, 2005 Page : 4 of 17

$$(CONH_2)_2$$

$$F_1$$

$$(NH_2)_2$$

$$HO - C$$

$$C - OH$$

$$HO - C$$

$$HO - C$$

$$C - OH$$

$$F_1$$

$$Y_m$$

$$HO - C$$

$$C - OH$$

$$HO - C$$

$$C - OH$$

$$V_m$$

$$V$$

wherein Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent, l is an integer in the range of 1 - 4, m is an integer in the range of 0 - 3, provided that the total number of 1 and m (1 + m) is 4, and X' stands for a tetravalent organic group.

6. (Previously presented) A method for the production of polyimide represented by the formula (10), which comprises the steps of:

producing a fluorinated phenylenediamine represented by the formula (2) by reacting a diamide represented by the formula (1) with NaOX [wherein X stands for a bromine atom (Br) or a chlorine atom (Cl)] at a molar ratio of the NaOX to the diamide (NaOX/diamide ratio) in the range of 3.0 - 6.0 and NaOH at a molar ratio of the NaOH to

Serial No. : 10/561,048
Filed : December 14, 2005
Page : 5 of 17

the diamide (NaOH/diamide ratio) in the range of 1.8 - 6.0; and

producing a polyamic acid represented by the formula (9) by reacting the fluorinated phenylenediamine with tetracaraboxylic acid represented by the formula (8), the acid anhydride or acid chloride thereof, or the ester thereof in an organic solvent; and cyclizing by heating the polyamic acid,

$$F_{1} = Y_{m}$$

$$(CONH_{2})_{2}$$

$$F_{1} = Y_{m}$$

$$(1)$$

$$(CONH_{2})_{2}$$

$$(2)$$

$$(NH_{2})_{2}$$

$$(2)$$

$$(NH_{2})_{2}$$

$$(3)$$

$$(NH_{2})_{2}$$

$$(4)$$

$$(8)$$

$$(8)$$

$$(7)$$

$$(8)$$

$$(8)$$

$$(8)$$

$$(7)$$

$$(8)$$

$$(8)$$

$$(9)$$

$$(10)$$

$$(10)$$

$$(10)$$

$$(10)$$

$$(10)$$

$$(10)$$

wherein Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_3 alkyl group optionally having a substituent, or a C_1 -

Serial No. : 10/561,048
Filed : December 14, 2005
Page : 6 of 17

 C_5 alkoxyl group optionally having a substituent, 1 is an integer in the range of 1 - 4, m is an integer in the range of 0 - 3, provided that the total number of 1 and m (1 + m) is 4, and X' stands for a tetravalent organic group.

(Previously presented) A method according to claim 2, wherein said diamide
is a diamide represented by the following formula (4) and said phenylenediamine is a
phenylenediamine represented by the following formula (5)

$$H_2NOC$$
 $CONH_2$
 F_3
 F_3

wherein in the formulas (4) and (5), Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent.

- (Previously presented) A method according to claim 2, wherein the molar absorption coefficient of the fluorinated phenylenediamine represented by the formula (2) at a wavelength of 450 nm is not more than 2.5 (I/mol·cm).
- (Previously presented) A method according to claim 3, wherein the molar absorption coefficient of the fluorinated phenylenediamine represented by the formula (2) at a wavelength of 450 nm is not more than 2.5 (I/mol-cm).
- 10. (Previously presented) A method according to claim 7, wherein the molar absorption coefficient of the fluorinated phenylenediamine represented by the formula (2) at a wavelength of 450 nm is not more than 2.5 (l/mol·cm).

Serial No. : 10/561,048 Filed : December 14, 2005 Page : 7 of 17

11. (Previously presented) A method for the production of a polyamic acid represented by the formula (9), which comprises the steps of:

producing a fluorinated phenylenediamine represented by the formula (2) by reacting a diamide represented by the formula (1) with NaOX [wherein X stands for a bromine atom (Br) or a chlorine atom (Cl)] at a molar ratio of the NaOX to the diamide (NaOX/diamide ratio) in the range of 3.0 - 6.0 and NaOH at a molar ratio of the NaOH to the diamide (NaOH/diamide ratio) in the range of 1.8 - 6.0, at a temperature in the range of 0 - 20°C and by heating the resultant reaction product subsequently at a temperature exceeding 20°C and not exceeding 100°C; and

reacting the fluorinated phenylenediamine produced with tetracaraboxylic acid represented by the formula (8), the acid anhydride or acid chloride thereof, or the ester thereof in an organic solvent,

$$F_{1} \qquad Y_{m} \qquad (1)$$

$$(CONH_{2})_{2} \qquad (2)$$

$$F_{1} \qquad Y_{m} \qquad (2)$$

$$(NH_{2})_{2} \qquad (8)$$

$$HO - C \qquad C - OH$$

$$HO - C \qquad C - OH$$

$$HO - C \qquad CONH - (9)$$

$$HOOC \qquad COOH$$

Serial No. : 10/561,048 Filed : December 14, 2005 Page : 8 of 17

wherein Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent, 1 is an integer in the range of 1 - 4, m is an integer in the range of 0 - 3, provided that the total number of 1 and m (1 + m) is 4, and X' stands for a tetravalent organic group.

12. (Currently amended) A method for the production of polyimide represented by the formula (10), which comprises the steps of:

producing a fluorinated phenylenediamine represented by the formula (2) by reacting a diamide represented by the formula (1) with NaOX [wherein X stands for a bromine atom (Br) or a chlorine atom (Cl)] at a molar ratio of the NaOX to the diamide (NaOX/diamide ratio) in the range of 3.0 - 6.0 and NaOH at a molar ratio of the NaOH to the diamide (NaOH/diamide ratio) in the range of 1.8 - 6.0, at a temperature in the range of 0 - 20°C and by heating the resultant reaction product subsequently at a temperature exceeding 20°C and not exceeding 100°C; and

producing a polyamic acid represented by the formula (9) by reacting the fluorinated phenylenediamine with tetracaraboxylic acid represented by the formula (8), the acid anhydride or acid chloride thereof, or the ester thereof in an organic solvent; and cyclizing by heating the polyamic acid,

$$F_1$$
 Y_m
 $(CONH_2)_2$
 F_1
 Y_m
 $(NH_2)_2$

Attorney Docket No.: 60004-109US1

Applicant(s): Shinji Nishimae et al. Serial No.: 10/561,048 Filed: December 14, 2005

Page : 9 of 17

wherein Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent, l is an integer in the range of 1, m is an integer in the range of 0 - 3, provided that the total number of 1 and m (l + m) is 4, and X' stands for a tetravalent organic group.